

or formal training for handling a hazardous materials transportation accident.

About 1 hour after the crash, emergency response persons began complaining of respiratory and skin problems, and 48 of them were evacuated from the accident site and taken to a hospital for treatment, including the police officers who initially examined the cargo's shipping papers. About the same time, Matlack's drivers were also transported to a hospital and carried the shipping papers with them.

The emergency response personnel at the site knew the name of the cargo, but initially were unable to obtain information on its potential hazards and on the emergency response procedures to follow. When Matlack officials arrived on-scene and discovered that the shipping papers were not in the truck cab, a police official called the hospital where the drivers were being treated to obtain a verbatim reading of the papers. The papers confirmed the name of the cargo, but they did not contain emergency response guidance. The hospital treating the 48 emergency response persons did not have medical treatment information on DVB and substituted the medical treatment prescribed for benzene exposure.

The primary, on-scene reference material on hazardous materials was the *Hazardous Materials Emergency Response Guidebook* (Guidebook) 1980 edition, published by the Materials Transportation Bureau, Research and Special Programs Administration, U.S. Department of Transportation. Divinylbenzene is not one of the hazardous materials listed by name in the Guidebook.

Witnesses stated that emergency personnel looked for divinylbenzene in the Guidebook and, upon discovering that it was not listed, followed the response guidelines prescribed for divinyl ether—the only Guidebook entry with the term "divinyl." The entry for divinyl ether refers the reader to Guide 30, which first describes the material as a poison which may be fatal through inhalation, oral intake, or skin absorption, and second, capable of producing a spreading, flammable vapor. Information contained on the truck's placards (I.D. #1993, U.N. hazard class #3, and a flame symbol over a red background) directs the emergency response personnel to Guide 26 in the Guidebook; however, witnesses reported that the placards, although undamaged and unobscured, were not used to identify the cargo during the early stages of the incident. The appropriate guide, #26, first describes the various commodities in this group, including DVB, as capable of burning, and second, of producing vapors which may cause dizziness or suffocation as well as skin and eye irritation. The difference in the primary risk described in the two guides would explain the limited caution exercised by emergency response personnel.

The absence of shipping papers, the failure to observe placards, and the misuse or misunderstanding of the *Hazardous Materials Emergency Response Guidebook* reportedly combined to increase uncertainty among public officials, to protract the incident both in time and scope, and to lead to a reduced level of cooperation between emergency response personnel and carrier representatives. The lack of experience and

training of those responding to this accident in handling hazardous materials and the lack of emergency response information specific to the transported hazardous material are by no means unique in highway accidents throughout the Nation.

Progress has been made over the last decade in providing information to emergency response groups on hazardous materials involved in accidents; however, critical information available to first arriving emergency personnel is still limited in many respects, especially for n.o.s. products. The Department of Transportation regulations require that hazardous materials shipments be placarded and accompanied by shipping documents. In addition, the Department has expended considerable time and effort in developing, updating, and disseminating nearly one-half million copies of its *Hazardous Materials Emergency Response Guidebook* for use by emergency response personnel. However, this Guidebook (for sound practical reasons) and the required shipping documents lack physical property data, medical treatment guidance, environmental precautions, and detailed hazard conditions which are specific to the commodity in transit. These data sources give emergency responders general information on the potential hazards during the first 20-30 minutes into the accident. In most cases, however, additional references must be identified, quickly accessed, and used to determine the hazards and remedies for the specific commodity being transported.

Specific emergency guidance information is often not readily available when n.o.s. shipments are involved in accidents. For example, the I.D. number on the placard in this incident was "1993" which identifies divinylbenzene also applies to 17 other commodities or groups of commodities listed in the tables of 49 CFR 172. In addition, n.o.s. commodities are less likely to be included in commonly used emergency response guides than are specified commodities. Divinylbenzene, for example, in addition to not being listed in DOT's *Hazardous Materials Emergency Response Guidebook*, is not listed in the U.S. Coast Guard's *Chemical Hazards Response Information System (CHRIS)* manual, the Association of American Railroad's *Emergency Handling of Hazardous Materials in Surface Transportation Guide*, or the National Institute for Occupational Safety and Health/Occupational Safety and Health Administration (NIOSH/OSHA) "Pocket Guide to Chemical Hazards"—some of the most widely used guides. Divinylbenzene is listed in the *Fire Protection Guide on Hazardous Materials*, published by the National Fire Protection Association.

The Safety Board is aware that the development and distribution to emergency responders of an all purpose data sheet for every hazardous material subject to transportation would be a formidable and expensive task. Fortunately, information of this type already exists for most chemicals manufactured in this country. One source is the Material Safety Data Sheet which, in two pages, provides the manufacturer's name, physical property data, medical treatment, fire and explosion hazards, environmental

protection guidance, protective measures, and other hazard information—all specific to the chemical in question. The OSHA recommends that a Material Safety Data Sheet be available at the workplace for each hazardous material which is handled there. An OSHA official reported that it is "rare" to find a manufacturing or shipping facility which does not follow this recommendation. The Safety Board is also aware that these documents are commercially available from a variety of sources. Moreover, one commercial service collects chemical and protective action data from a variety of government and industry sources and provides hard-copy information via a telephone-computer link to subscribers of the service.

The product-specific information available from such sources would be an asset to emergency response personnel if it were to accompany the shipping papers. Such information is widely used and readily available to shippers and manufacturers and could be supplied by carriers at a minimal cost per shipment. The Safety Board believes that use of this type of information as a part of the hazardous materials shipping documents which greatly benefit the effective handling of emergencies involving bulk shipments of hazardous materials. The ranking emergency response official at the Odessa incident obtained a divinylbenzene Materials Safety Data Worksheet on the second day of the emergency. According to the official, had the data sheet been available at the outset, considerable time would have been saved in identifying the cargo, the health effects from exposure to the hazardous materials, and the type of emergency activities necessary to respond to the accident.

Therefore, the National Transportation Safety Board recommends that the U.S. Department of Transportation, Research and Special Programs Administration: Determine, by mode of transportation, the feasibility of requiring comprehensive product-specific emergency response information such as Materials Safety Data Sheets, to be appended to shipping documents for hazardous materials transported in bulk quantities, giving particular attention to the early emergency response problems posed by n.o.s. commodities in transit. For those modes of transportation for which a positive determination results, incorporate necessary requirements into Title 49 of the Code of Federal Regulations. (Class 11, Priority Action) (I-83-2)

The following basic health threat information is stated for divinylbenzene in NFPA's *Fire Protection Guide on Hazardous Materials* (NFPA 49), Seventh Edition: LIFE HAZARD—Moderately toxic by inhalation. Eye and respiratory irritant. Effect on skin unknown but probably little, if any.

The following basic health threat information is taken from the Material Safety Data Sheet prepared by the manufacturer of the divinylbenzene involved in the accident referenced by